

Sub A

SEQUENCE LISTING

<110> ANTEXBIOLOGICS, INC.

<120> CHLAMYDIA PROTEIN, GENE SEQUENCE AND USES THEREOF

<130> 7969-076

<140>

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<150> 08/942,596

<151> 1997-10-02

<160> 41

<170> PatentIn Ver. 2.0

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<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:
recombinant expression vector

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<211> 1012

<212> PRT

<213> Chlamydia

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35 40 45

Thr Val Ile Gly Asp Pro Ser Gly Thr Thr Val Phe Ser Ala Gly Glu
50 55 60

Leu Thr Leu Lys Asn Leu Asp Asn Ser Ile Ala Ala Leu Pro Leu Ser
65 70 75 80

Cys Phe Gly Asn Leu Leu Gly Ser Phe Thr Val Leu Gly Arg Gly His
85 90 95

Ser Leu Thr Phe Glu Asn Ile Arg Thr Ser Thr Asn Gly Ala Ala Leu
100 105 110

Ser Asn Ser Ala Ala Asp Gly Leu Phe Thr Ile Glu Gly Phe Lys Glu
115 120 125

Leu Ser Phe Ser Asn Cys Asn Ser Leu Leu Ala Val Leu Pro Ala Ala
130 135 140

Thr Thr Asn Lys Gly Ser Gln Thr Pro Thr Thr Ser Thr Pro Ser
145 150 155 160

Asn Gly Thr Ile Tyr Ser Lys Thr Asp Leu Leu Leu Asn Asn Glu
165 170 175

Lys Phe Ser Phe Tyr Ser Asn Leu Val Ser Gly Asp Gly Gly Ala Ile
180 185 190

Asp Ala Lys Ser Leu Thr Val Gln Gly Ile Ser Lys Leu Cys Val Phe
195 200 205

Gln Glu Asn Thr Ala Gln Ala Asp Gly Gly Ala Cys Gln Val Val Thr
210 215 220

Ser Phe Ser Ala Met Ala Asn Glu Ala Pro Ile Ala Phe Val Ala Asn
225 230 235 240

Val Ala Gly Val Arg Gly Gly Ile Ala Ala Val Gln Asp Gly Gln
245 250 255

Gln Gly Val Ser Ser Ser Thr Ser Thr Glu Asp Pro Val Val Ser Phe
260 265 270

Ser Arg Asn Thr Ala Val Glu Phe Asp Gly Asn Val Ala Arg Val Gly
275 280 285

Gly Gly Ile Tyr Ser Tyr Gly Asn Val Ala Phe Leu Asn Asn Gly Lys
290 295 300

Thr Leu Phe Leu Asn Asn Val Ala Ser Pro Val Tyr Ile Ala Ala Lys
305 310 315 320

Gln Pro Thr Ser Gly Gln Ala Ser Asn Thr Ser Asn Asn Tyr Gly Asp
325 330 335

Gly Gly Ala Ile Phe Cys Lys Asn Gly Ala Gln Ala Gly Ser Asn Asn
340 345 350

Ser Gly Ser Val Ser Phe Asp Gly Glu Gly Val Val Phe Phe Ser Ser
355 360 365

Asn Val Ala Ala Gly Lys Gly Ala Ile Tyr Ala Lys Lys Leu Ser
370 375 380

Val Ala Asn Cys Gly Pro Val Gln Phe Leu Arg Asn Ile Ala Asn Asp
385 390 395 400

Gly Gly Ala Ile Tyr Leu Gly Glu Ser Gly Glu Leu Ser Leu Ser Ala
405 410 415

Asp Tyr Gly Asp Ile Ile Phe Asp Gly Asn Leu Lys Arg Thr Ala Lys
420 425 430

Glu Asn Ala Ala Asp Val Asn Gly Val Thr Val Ser Ser Gln Ala Ile
435 440 445

Ser Met Gly Ser Gly Gly Lys Ile Thr Thr Leu Arg Ala Lys Ala Gly
450 455 460

His Gln Ile Leu Phe Asn Asp Pro Ile Glu Met Ala Asn Gly Asn Asn
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Gln Pro Ala Gln Ser Ser Lys Leu Leu Lys Ile Asn Asp Gly Glu Gly
485 490 495

Tyr Thr Gly Asp Ile Val Phe Ala Asn Gly Ser Ser Thr Leu Tyr Gln
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Asn Val Thr Ile Glu Gln Gly Arg Ile Val Leu Arg Glu Lys Ala Lys
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Leu Ser Val Asn Ser Leu Ser Gln Thr Gly Gly Ser Leu Tyr Met Glu
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Ala Gly Ser Thr Trp Asp Phe Val Thr Pro Gln Pro Pro Gln Gln Pro
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Pro Ala Ala Asn Gln Leu Ile Thr Leu Ser Asn Leu His Leu Ser Leu
565 570 575

Ser Ser Leu Leu Ala Asn Asn Ala Val Thr Asn Pro Pro Thr Asn Pro
580 585 590

Pro Ala Gln Asp Ser His Pro Ala Val Ile Gly Ser Thr Thr Ala Gly
595 600 605

Ser Val Thr Ile Ser Gly Pro Ile Phe Phe Glu Asp Leu Asp Asp Thr
610 615 620

Ala Tyr Asp Arg Tyr Asp Trp Leu Gly Ser Asn Gln Lys Ile Asn Val
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660 665 670

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675 680 685

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690 695 700

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725 730 735

Arg Gly Leu Trp Val Ser Gly Val Ser Asn Phe Phe Tyr His Asp Arg
740 745 750

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755 760 765

Gly Ala Asn Ser Tyr Phe Gly Ser Ser Met Phe Gly Leu Ala Phe Thr
770 775 780

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Gly Asn Gln His Met Lys Thr Ser Tyr Thr Phe Ala Glu Glu Ser Asp
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Val Arg Trp Asp Asn Asn Cys Leu Ala Gly Glu Ile Gly Ala Gly Leu
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Phe Val Gln Ala Glu Phe Ser Tyr Ala Asp His Glu Ser Phe Thr Glu
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Glu Gly Asp Gln Ala Arg Ala Phe Lys Ser Gly His Leu Leu Asn Leu
900 905 910

Ser Val Pro Val Gly Val Lys Phe Asp Arg Cys Ser Ser Thr His Pro
915 920 925

Asn Lys Tyr Ser Phe Met Ala Ala Tyr Ile Cys Asp Ala Tyr Arg Thr
930 935 940

Ile Ser Gly Thr Glu Thr Thr Leu Leu Ser His Gln Glu Thr Trp Thr
945 950 955 960

Thr Asp Ala Phe His Leu Ala Arg His Gly Val Val Val Arg Gly Ser
965 970 975

Met Tyr Ala Ser Leu Thr Ser Asn Ile Glu Val Tyr Gly His Gly Arg
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Arg Val Arg Phe
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<212> PRT

<213> Chlamydia

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<211> 1444

<212> DNA

<213> Chlamydia

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35 40 45

Thr Val Ile Gly Asp Pro Ser Gly Thr Thr Val Phe Ser Ala Gly Glu
50 55 60

Leu Thr Leu Lys Asn Leu Asp Asn Ser Ile Ala Ala Leu Pro Leu Ser
65 70 75 80

Cys Phe Gly Asn Leu Leu Gly Ser Phe Thr Val Leu Gly Arg Gly His
85 90 95

Ser Leu Thr Phe Glu Asn Ile Arg Thr Ser Thr Asn Gly Ala Ala Leu
100 105 110

Ser Asp Ser Ala Asn Ser Gly Leu Phe Thr Ile Glu Gly Phe Lys Glu

115 120 125

Leu Ser Phe Ser Asn Cys Asn Pro Leu Leu Ala Val Leu Pro Ala Ala
130 135 140

Thr Thr Asn Asn Gly Ser Gln Thr Pro Ser Thr Thr Ser Thr Pro Ser
145 150 155 160

Asn Gly Thr Ile Tyr Ser Lys Thr Asp Leu Leu Leu Asn Asn Glu
165 170 175

Lys Phe Ser Phe Tyr Ser Asn Ser Val Ser Gly Asp Gly Gly Ala Ile
180 185 190

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195 200 205

Gln Glu Asn Thr Ala Gln Ala Asp Gly Gly Ala Cys Gln Val Val Thr
210 215 220

Ser Phe Ser Ala Met Ala Asn Glu Ala Pro Ile Ala Phe Val Ala Asn
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Val Ala Gly Val Arg Gly Gly Ile Ala Ala Val Gln Asp Gly Gln
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Ser Arg Asn Thr Ala Val Glu Phe Asp Gly Asn Val Ala Arg Val Gly
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Thr Leu Phe Leu Asn Asn Val Ala Ser Pro Val Tyr Ile Ala Ala Glu
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Gln Pro Thr Asn Gly Gln Ala Ser Asn Thr Ser Asp Asn Tyr Gly Asp
325 330 335

Gly Gly Ala Ile Phe Cys Lys Asn Gly Ala Gln Ala Ala Gly Ser Asn
340 345 350

Asn Ser Gly Ser Val Ser Phe Asp Gly Glu Gly Val Val Phe Phe Ser
355 360 365

Ser Asn Val Ala Ala Gly Lys Gly Gly Ala Ile Tyr Ala Lys Lys Leu

370 375 380

Ser Val Ala Asn Cys Gly Pro Val Gln Leu Leu Gly Asn Ile Ala Asn
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Asp Gly Gly Ala Ile Tyr Leu Gly Glu Ser Gly Glu Leu Ser Leu Ser
405 410 415

Ala Asp Tyr Gly Asp Met Ile Phe Asp Gly Asn Leu Lys Arg Thr Ala
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Lys Glu Asn Ala Ala Asp Val Asn Gly Val Thr Val Ser Ser Gln Ala
435 440 445

Ile Ser Met Gly Ser Gly Gly Lys Ile Thr Thr Leu Arg Ala Lys Ala
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Gly His Gln Ile Leu Phe Asn Asp Pro Ile Glu Met Ala Asn Gly Asn
465 470 475 480

Asn Gln Pro Ala Gln Ser Ser Glu Pro Leu Lys Ile Asn Asp Gly Glu
485 490 495

Gly Tyr Thr Gly Asp Ile Val Phe Ala Asn Gly Asn Ser Thr Leu Tyr
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Gln Asn Val Thr Ile Glu Gln Gly Arg Ile Val Leu Arg Glu Lys Ala
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Lys Leu Ser Val Asn Ser Leu Ser Gln Thr Gly Gly Ser Leu Tyr Met
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Glu Ala Gly Ser Thr Leu Asp Phe Val Thr Pro Gln Pro Pro Gln Gln
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Pro Pro Ala Ala Asn Gln Ser Ile Thr Leu Ser Asn Leu His Leu Ser
565 570 575

Leu Ser Ser Leu Leu Ala Asn Asn Ala Val Thr Asn Pro Pro Thr Asn
580 585 590

Pro Pro Ala Gln Asp Ser His Pro Ala Val Ile Gly Ser Thr Thr Ala
595 600 605

Gly Ser Val Thr Ile Ser Gly Pro Ile Phe Phe Glu Asp Leu Asp Asp
610 615 620

Thr Ala Tyr Asp Arg Tyr Asp Trp Leu Gly Ser Asn Gln Lys Ile Asp

625 630 635 640

Val Leu Lys Leu Gln Leu Gly Thr Gln Pro Pro Ala Asn Ala Pro Ser
 645 650 655

Asp Leu Thr Leu Gly Asn Glu Met Pro Lys Tyr Gly Tyr Gln Gly Ser
 660 665 670

Trp Lys Leu Ala Trp Asp Pro Asn Thr Ala Asn Asn Gly Pro Tyr Thr
 675 680 685

Leu Lys Ala Thr Trp Thr Lys Thr Gly Tyr Asn Pro Gly Pro Glu Arg
 690 695 700

Val Ala Ser Leu Val Pro Asn Ser Leu Trp Gly Ser Ile Leu Asp Ile
 705 710 715 720

Arg Ser Ala His Ser Ala Ile Gln Ala Ser Val Asp Gly Arg Ser Tyr
 725 730 735

Cys Arg Gly Leu Trp Val Ser Gly Val Ser Asn Phe Phe Tyr His Asp
 740 745 750

Arg Asp Ala Leu Gly Gln Gly Tyr Arg Tyr Ile Ser Gly Gly Tyr Ser
 755 760 765

Leu Gly Ala Asn Ser Tyr Phe Gly Ser Ser Met Phe Gly Leu Ala Phe
 770 775 780

Thr Glu Val Phe Gly Arg Ser Lys Asp Tyr Val Val Cys Arg Ser Asn
 785 790 795 800

His His Ala Cys Ile Gly Ser Val Tyr Leu Ser Thr Lys Gln Ala Leu
 805 810 815

Cys Gly Ser Tyr Val Phe Gly Asp Ala Phe Ile Arg Ala Ser Tyr Gly
 820 825 830

Phe Gly Asn Gln His Met Lys Thr Ser Tyr Thr Phe Ala Glu Glu Ser
 835 840 845

Asp Val Cys Trp Asp Asn Asn Cys Leu Val Gly Glu Ile Gly Val Gly
 850 855 860

Leu Pro Ile Val Ile Thr Pro Ser Lys Leu Tyr Leu Asn Glu Leu Arg
 865 870 875 880

Pro Phe Val Gln Ala Glu Phe Ser Tyr Ala Asp His Glu Ser Phe Thr

885

890

895

Glu Glu Gly Asp Gln Ala Arg Ala Phe Arg Ser Gly His Leu Met Asn
900 905 910

Leu Ser Val Pro Val Gly Val Lys Phe Asp Arg Cys Ser Ser Thr His
915 920 925

Pro Asn Lys Tyr Ser Phe Met Gly Ala Tyr Ile Cys Asp Ala Tyr Arg
930 935 940

Thr Ile Ser Gly Thr Gln Thr Thr Leu Leu Ser His Gln Glu Thr Trp
945 950 955 960

Thr Thr Asp Ala Phe His Leu Ala Arg His Gly Val Ile Val Arg Gly
965 970 975

Ser Met Tyr Ala Ser Leu Thr Ser Asn Ile Glu Val Tyr Gly His Gly
980 985 990

Arg Tyr Glu Tyr Arg Asp Thr Ser Arg Gly Tyr Gly Leu Ser Ala Gly
995 1000 1005

Ser Lys Val Arg Phe
1010

<210> 16

<211> 1013

<212> PRT

<213> Chlamydia

<400> 16

Met Gln Thr Ser Phe His Lys Phe Phe Leu Ser Met Ile Leu Ala Tyr
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Ser Cys Cys Ser Leu Thr Gly Gly Tyr Ala Ala Glu Ile Met Val
20 25 30

Pro Gln Gly Ile Tyr Asp Gly Glu Thr Leu Thr Val Ser Phe Pro Tyr
35 40 45

Thr Val Ile Gly Asp Pro Ser Gly Thr Thr Val Phe Ser Ala Gly Glu
50 55 60

Leu Thr Leu Lys Asn Leu Asp Asn Ser Ile Ala Ala Leu Pro Leu Ser
65 70 75 80

Cys Phe Gly Asn Leu Leu Gly Ser Phe Thr Val Leu Gly Arg Gly His
 85 90 95

 Ser Leu Thr Phe Glu Asn Ile Arg Thr Ser Thr Asn Gly Ala Ala Leu
 100 105 110

 Ser Asp Ser Ala Asn Ser Gly Leu Phe Thr Ile Glu Gly Phe Lys Glu
 115 120 125

 Leu Ser Phe Ser Asn Cys Asn Ser Leu Leu Ala Val Leu Pro Ala Ala
 130 135 140

 Thr Thr Asn Asn Gly Ser Gln Thr Pro Thr Thr Ser Thr Pro Ser
 145 150 155 160

 Asn Gly Thr Ile Tyr Ser Lys Thr Asp Leu Leu Leu Leu Asn Asn Glu
 165 170 175

 Lys Phe Ser Phe Tyr Ser Asn Leu Val Ser Gly Asp Gly Gly Thr Ile
 180 185 190

 Asp Ala Lys Ser Leu Thr Val Gln Gly Ile Ser Lys Leu Cys Val Phe
 195 200 205

 Gln Glu Asn Thr Ala Gln Ala Asp Gly Gly Ala Cys Gln Val Val Thr
 210 215 220

 Ser Phe Ser Ala Met Ala Asn Glu Ala Pro Ile Ala Phe Ile Ala Asn
 225 230 235 240

 Val Ala Gly Val Arg Gly Gly Ile Ala Ala Val Gln Asp Gly Gln
 245 250 255

 Gln Gly Val Ser Ser Ser Thr Ser Thr Glu Asp Pro Val Val Ser Phe
 260 265 270

 Ser Arg Asn Thr Ala Val Glu Phe Asp Gly Asn Val Ala Arg Val Gly
 275 280 285

 Gly Gly Ile Tyr Ser Tyr Gly Asn Val Ala Phe Leu Asn Asn Gly Lys
 290 295 300

 Thr Leu Phe Leu Asn Asn Val Ala Ser Pro Val Tyr Ile Ala Ala Glu
 305 310 315 320

 Gln Pro Thr Asn Gly Gln Ala Ser Asn Thr Ser Asp Asn Tyr Gly Asp
 325 330 335

Gly Gly Ala Ile Phe Cys Lys Asn Gly Ala Gln Ala Ala Gly Ser Asn
340 345 350

Asn Ser Gly Ser Val Ser Phe Asp Gly Glu Gly Val Val Phe Phe Ser
355 360 365

Ser Asn Val Ala Ala Gly Lys Gly Gly Ala Ile Tyr Ala Lys Lys Leu
370 375 380

Ser Val Ala Asn Cys Gly Pro Val Gln Phe Leu Gly Asn Ile Ala Asn
385 390 395 400

Asp Gly Gly Ala Ile Tyr Leu Gly Glu Ser Gly Glu Leu Ser Leu Ser
405 410 415

Ala Asp Tyr Gly Asp Ile Ile Phe Asp Gly Asn Leu Lys Arg Thr Ala
420 425 430

Lys Glu Asn Ala Ala Asp Val Asn Gly Val Thr Val Ser Ser Gln Ala
435 440 445

Ile Ser Met Gly Ser Gly Gly Lys Ile Thr Thr Leu Arg Ala Lys Ala
450 455 460

Gly His Gln Ile Leu Phe Asn Asp Pro Ile Glu Met Ala Asn Gly Asn
465 470 475 480

Asn Gln Pro Ala Gln Ser Ser Glu Pro Leu Lys Ile Asn Asp Gly Glu
485 490 495

Gly Tyr Thr Gly Asp Ile Val Phe Ala Asn Gly Asn Ser Thr Leu Tyr
500 505 510

Gln Asn Val Thr Ile Glu Gln Gly Arg Ile Val Leu Arg Glu Lys Ala
515 520 525

Lys Leu Ser Val Asn Ser Leu Ser Gln Thr Gly Gly Ser Leu Tyr Met
530 535 540

Glu Ala Gly Ser Thr Leu Asp Phe Val Thr Pro Gln Pro Pro Gln Gln
545 550 555 560

Pro Pro Ala Ala Asn Gln Leu Ile Thr Leu Ser Asn Leu His Leu Ser
565 570 575

Leu Ser Ser Leu Leu Ala Asn Asn Ala Val Thr Asn Pro Pro Thr Asn
580 585 590

D E S C R I P T I O N

Pro Pro Ala Gln Asp Ser His Pro Ala Val Ile Gly Ser Thr Thr Ala
595 600 605

Gly Pro Val Thr Ile Ser Gly Pro Phe Phe Phe Glu Asp Leu Asp Asp
610 615 620

Thr Ala Tyr Asp Arg Tyr Asp Trp Leu Gly Ser Asn Gln Lys Ile Asp
625 630 635 640

Val Leu Lys Leu Gln Leu Gly Thr Gln Pro Ser Ala Asn Ala Pro Ser
645 650 655

Asp Leu Thr Leu Gly Asn Glu Met Pro Lys Tyr Gly Tyr Gln Gly Ser
660 665 670

Trp Lys Leu Ala Trp Asp Pro Asn Thr Ala Asn Asn Gly Pro Tyr Thr
675 680 685

Leu Lys Ala Thr Trp Thr Lys Thr Gly Tyr Asn Pro Gly Pro Glu Arg
690 695 700

Val Ala Ser Leu Val Pro Asn Ser Leu Trp Gly Ser Ile Leu Asp Ile
705 710 715 720

Arg Ser Ala His Ser Ala Ile Gln Ala Ser Val Asp Gly Arg Ser Tyr
725 730 735

Cys Arg Gly Leu Trp Val Ser Gly Val Ser Asn Phe Ser Tyr His Asp
740 745 750

Arg Asp Ala Leu Gly Gln Gly Tyr Arg Tyr Ile Ser Gly Gly Tyr Ser
755 760 765

Leu Gly Ala Asn Ser Tyr Phe Gly Ser Ser Met Phe Gly Leu Ala Phe
770 775 780

Thr Glu Val Phe Gly Arg Ser Lys Asp Tyr Val Val Cys Arg Ser Asn
785 790 795 800

His His Ala Cys Ile Gly Ser Val Tyr Leu Ser Thr Lys Gln Ala Leu
805 810 815

Cys Gly Ser Tyr Leu Phe Gly Asp Ala Phe Ile Arg Ala Ser Tyr Gly
820 825 830

Phe Gly Asn Gln His Met Lys Thr Ser Tyr Thr Phe Ala Glu Glu Ser
835 840 845

Asp Val Arg Trp Asp Asn Asn Cys Leu Val Gly Glu Ile Gly Val Gly
850 855 860

Leu Pro Ile Val Thr Thr Pro Ser Lys Leu Tyr Leu Asn Glu Leu Arg
865 870 875 880

Pro Phe Val Gln Ala Glu Phe Ser Tyr Ala Asp His Glu Ser Phe Thr
885 890 895

Glu Glu Gly Asp Gln Ala Arg Ala Phe Arg Ser Gly His Leu Met Asn
900 905 910

Leu Ser Val Pro Val Gly Val Lys Phe Asp Arg Cys Ser Ser Thr His
915 920 925

Pro Asn Lys Tyr Ser Phe Met Gly Ala Tyr Ile Cys Asp Ala Tyr Arg
930 935 940

Thr Ile Ser Gly Thr Gln Thr Thr Leu Leu Ser His Gln Glu Thr Trp.
945 950 955 960

Thr Thr Asp Ala Phe His Leu Ala Arg His Gly Val Ile Val Arg Gly
965 970 975

Ser Met Tyr Ala Ser Leu Thr Ser Asn Ile Glu Val Tyr Gly His Gly
980 985 990

Arg Tyr Glu Tyr Arg Asp Thr Ser Arg Gly Tyr Gly Leu Ser Ala Gly
995 1000 1005

Ser Lys Val Arg Phe
1010

<210> 17

<211> 505

<212> PRT

<213> Chlamydia

<400> 17

Glu Ile Met Val Pro Gln Gly Ile Tyr Asp Gly Glu Thr Leu Thr Val
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Ser Phe Pro Tyr Thr Val Ile Gly Asp Pro Ser Gly Thr Thr Val Phe
20 25 30

Ser Ala Gly Glu Leu Thr Leu Lys Asn Leu Asp Asn Ser Ile Ala Ala
35 40 45

Leu Pro Leu Ser Cys Phe Gly Asn Leu Leu Gly Ser Phe Thr Val Leu
50 55 60

Gly Arg Gly His Ser Leu Thr Phe Glu Asn Ile Arg Thr Ser Thr Asn
65 70 75 80

Gly Ala Ala Leu Ser Asn Ser Ala Ala Asp Gly Leu Phe Thr Ile Glu
85 90 95

Gly Phe Lys Glu Leu Ser Phe Ser Asn Cys Asn Ser Leu Leu Ala Val
100 105 110

Leu Pro Ala Ala Thr Thr Asn Lys Gly Ser Gln Thr Pro Thr Thr Thr
115 120 125

Ser Thr Pro Ser Asn Gly Thr Ile Tyr Ser Lys Thr Asp Leu Leu Leu
130 135 140

Leu Asn Asn Glu Lys Phe Ser Phe Tyr Ser Asn Leu Val Ser Gly Asp
145 150 155 160

Gly Gly Ala Ile Asp Ala Lys Ser Leu Thr Val Gln Gly Ile Ser Lys
165 170 175

Leu Cys Val Phe Gln Glu Asn Thr Ala Gln Ala Asp Gly Gly Ala Cys
180 185 190

Gln Val Val Thr Ser Phe Ser Ala Met Ala Asn Glu Ala Pro Ile Ala
195 200 205

Phe Val Ala Asn Val Ala Gly Val Arg Gly Gly Ile Ala Ala Val
210 215 220

Gln Asp Gly Gln Gln Gly Val Ser Ser Thr Ser Thr Glu Asp Pro
225 230 235 240

Val Val Ser Phe Ser Arg Asn Thr Ala Val Glu Phe Asp Gly Asn Val
245 250 255

Ala Arg Val Gly Gly Ile Tyr Ser Tyr Gly Asn Val Ala Phe Leu
260 265 270

Asn Asn Gly Lys Thr Leu Phe Leu Asn Asn Val Ala Ser Pro Val Tyr
275 280 285

Ile Ala Ala Lys Gln Pro Thr Ser Gly Gln Ala Ser Asn Thr Ser Asn
290 295 300

DRAFT - DRAFT - DRAFT

Asn Tyr Gly Asp Gly Gly Ala Ile Phe Cys Lys Asn Gly Ala Gln Ala
305 310 315 320

Gly Ser Asn Asn Ser Gly Ser Val Ser Phe Asp Gly Glu Gly Val Val
325 330 335

Phe Phe Ser Ser Asn Val Ala Ala Gly Lys Gly Gly Ala Ile Tyr Ala
340 345 350

Lys Lys Leu Ser Val Ala Asn Cys Gly Pro Val Gln Phe Leu Arg Asn
355 360 365

Ile Ala Asn Asp Gly Gly Ala Ile Tyr Leu Gly Glu Ser Gly Glu Leu
370 375 380

Ser Leu Ser Ala Asp Tyr Gly Asp Ile Ile Phe Asp Gly Asn Leu Lys
385 390 395 400

Arg Thr Ala Lys Glu Asn Ala Ala Asp Val Asn Gly Val Thr Val Ser
405 410 415

Ser Gln Ala Ile Ser Met Gly Ser Gly Gly Lys Ile Thr Thr Leu Arg
420 425 430

Ala Lys Ala Gly His Gln Ile Leu Phe Asn Asp Pro Ile Glu Met Ala
435 440 445

Asn Gly Asn Asn Gln Pro Ala Gln Ser Ser Lys Leu Leu Lys Ile Asn
450 455 460

Asp Gly Glu Gly Tyr Thr Gly Asp Ile Val Phe Ala Asn Gly Ser Ser
465 470 475 480

Thr Leu Tyr Gln Asn Val Thr Ile Glu Gln Gly Arg Ile Val Leu Arg
485 490 495

Glu Lys Ala Lys Leu Ser Val Asp Ser
500 505

<210> 18

<211> 57

<212> DNA

<213> Chlamydia

<400> 18

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<210> 19
<211> 20
<212> DNA
<213> Chlamydia

<400> 19
cgctctagaa ctagtggatc 20

<210> 20
<211> 22
<212> DNA
<213> Chlamydia

<400> 20
atggttcctc aaggaattta cg 22

<210> 21
<211> 19
<212> DNA
<213> Chlamydia

<400> 21
ggtcccccat cagcgggag 19

<210> 22
<211> 1515
<212> DNA
<213> Chlamydia

<400> 22
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actgttatag gagatccgag tgggactact gtttttctg caggagagtt aacattaaaa 120
aatcttgaca attctattgc agcttgccct ttaagttgtt ttggaaactt attaggagt 180
tttactgttt tagggagagg acactcggtg actttcgaga acatacggac ttctacaaat 240
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ctaaaaattt acgatggtga aggatacaca ggggatattt ttttgctaa tggaaaggcagt 1440
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<210> 23

<211> 3354

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

recombinant expression vector

<400> 23

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ttaactgtat cattcccta tactttata ggagatccga gtgggactac tggggactac 180
gcaggaggt taacgttaaa aaatcttgc aattcttattt cagcttgc tttaaagggt 240
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aacatacggc cttctacaaa tggagctgca ctaagtgc aacgcataatcg cgggttattt 360
actattgagg gttttaaaga attatctttt tccaaatttgc acccattact tggcgactac 420
cctgctgcaa cgactaataa tggtagccag actccgtcga caacatctac accgtctaat 480
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catacattt catttacaca ttctcaaggg ccagttttc aaaattagcc ttca 3354

<210> 24

<211> 3324

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
recombinant expression vector

<400> 24

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tgttttggg acttattttagg gagtttact gtttttaggg aaggacactc gttgactttc 300
gagaacatac ggacttctac aaatggagct gcactaagtgc acagcgctaa tagcgggtta 360
tttactatttgc agggttttaa agaattatctt tttccaattt gcaactcattt acttgcgtt 420
ctgcctgctt caacgactaa taatggtagc cagactccga cgacaaacatc tacaccgtt 480
aatggacta ttatttctaa aacagatctt ttgttactca ataatgagaa gttctcattt 540

tatagttaatt tagtctctgg agatggggga actatacatg ctaagagctt aacggttcaa 600
ggaatttagca agctttgtgt ctccaaagaa aataactgctc aagctgatgg gggagcttgt 660
caagtagtca ccagtttctc tgctatggct aacgaggctc ctattgcctt tatacgcaat 720
gttgcaggag taagaggggg agggattgct gctgttcagg atggcagca gggagtgtca 780
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caagctcggg cattcaggag tggtcatctc atgaatctt cagttccgtt tggagtaaaa 2760
tttgatcgat gttcttagtac acaccctaat aaatatacg ttatggggc ttatatctgt 2820
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tggccattt cgtatggatt cgcaagctct cctcaagtgt taacacctaa tgtaaccact 3180
ccttttaagg gggacgtatgt ttacttgaat ggagactgcg ctttagtcaa tgtctatgca 3240
ggggcagaga acggctcaat tatctcagct aatggcgcaca attaacgt taccggacaa 3300
aaccatgcat tatcatttac agat 3324

<210> 25

<211> 65

<212> PRT

<213> Chlamydia

<400> 25

Pro Tyr Thr Val Ile Gly Asp Pro Ser Gly Thr Thr Val Phe Ser Ala
1 5 10 15

Gly Glu Leu Thr Leu Lys Asn Leu Asp Asn Ser Ile Ala Ala Pro Leu
20 25 30

Ser Cys Phe Gly Asn Leu Leu Gly Ser Phe Thr Val Leu Gly Arg Gly
35 40 45

His Ser Leu Thr Phe Glu Asn Ile Arg Thr Ser Thr Asn Gly Ala Ala
50 55 60

Leu

65

<210> 26

<211> 24

<212> PRT

<213> Chlamydia

<400> 26

Ala Ala Asn Gln Leu Ile Thr Leu Ser Asn Leu His Leu Ser Leu Ser
1 5 10 15

Ser Leu Leu Ala Asn Asn Ala Val

20

<210> 27

<211> 8

<212> PRT

<213> Chlamydia

<400> 27

Gly Tyr Thr Gly Asp Ile Val Phe
1 5

<210> 28

<211> 7

<212> PRT

<213> Chlamydia

<400> 28

Tyr Gly Asp Ile Ile Phe Asp
1 5

<210> 29

<211> 63

<212> PRT

<213> Chlamydura cerviniventris

<400> 29

Gly Tyr Ala Ala Glu Ile Met Val Pro Gln Gly Ile Tyr Asp Gly Glu
1 5 10 15

Thr Leu Thr Val Ser Phe Pro Tyr Thr Val Ile Gly Asp Pro Ser Gly
20 25 30

Thr Thr Val Phe Ser Ala Gly Glu Leu Thr Leu Lys Asn Leu Asp Asn
35 40 45

Ser Ile Ala Ala Leu Pro Leu Ser Cys Phe Gly Asn Leu Leu Gly
50 55 60

<210> 30

<211> 22

<212> PRT

<213> Chlamydia

<400> 30

Met Ala Asn Gly Asn Asn Gln Pro Ala Gln Ser Ser Lys Leu Leu Lys
1 5 10 15

Ile Asn Asp Gly Glu Gly
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<210> 31

<211> 14

<212> PRT

<213> Chlamydia

<400> 31

Ala Asn Gly Ser Ser Thr Leu Tyr Gln Asn Val Thr Ile Glu
1 5 10

<210> 32
<211> 10
<212> PRT
<213> Chlamydia

<400> 32
Lys Leu Ser Val Asn Ser Leu Ser Gln Thr
1 5 10

<210> 33
<211> 45
<212> PRT
<213> Chlamydia

<400> 33
Val Ile Gly Ser Thr Thr Ala Gly Ser Val Thr Ile Ser Gly Pro Ile
1 5 10 15

Phe Phe Glu Asp Leu Asp Asp Thr Ala Tyr Asp Arg Tyr Asp Trp Leu
20 25 30
Gly Ser Asn Gln Lys Ile Asn Val Leu Lys Leu Gln Leu
35 40 45

<210> 34
<211> 64
<212> PRT
<213> Chlamydia

<400> 34
Val Ile Gly Ser Thr Thr Ala Gly Ser Val Thr Ile Ser Gly Pro Ile
1 5 10 15
Phe Phe Glu Asp Leu Asp Asp Thr Ala Tyr Asp Arg Tyr Asp Trp Leu
20 25 30

Gly Ser Asn Gln Lys Ile Asn Val Leu Lys Leu Gln Leu Gly Thr Lys
35 40 45

Pro Pro Ala Asn Ala Pro Ser Asp Leu Thr Leu Gly Asn Glu Met Pro
50 55 60

<210> 35
<211> 10
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<213> Chlamydia

<400> 35.
Asp Pro Asn Thr Ala Asn Asn Gly Pro Tyr
1 5 10

<210> 36
<211> 458
<212> PRT
<213> Chlamydia

<400> 36
Gly Gly Ala Cys Gln Val Val Thr Ser Phe Ser Ala Met Ala Asn Glu
1 5 10 15

Ala Pro Ile Ala Phe Val Ala Asn Val Ala Gly Val Arg Gly Gly Gly
20 25 30

Ile Ala Ala Val Gln Asp Gly Gln Gln Gly Val Ser Ser Ser Thr Ser
35 40 45

Thr Glu Asp Pro Val Val Ser Phe Ser Arg Asn Thr Ala Val Glu Phe
50 55 60

Asp Gly Asn Val Ala Arg Val Gly Gly Ile Tyr Ser Tyr Gly Asn
65 70 75 80

Val Ala Phe Leu Asn Asn Gly Lys Thr Leu Phe Leu Asn Asn Val Ala
85 90 95

Ser Pro Val Tyr Ile Ala Ala Lys Gln Pro Thr Ser Gly Gln Ala Ser
100 105 110

Asn Thr Ser Asn Asn Tyr Gly Asp Gly Gly Ala Ile Phe Cys Lys Asn
115 120 125

Gly Ala Gln Ala Gly Ser Asn Asn Ser Gly Ser Val Ser Phe Asp Gly
130 135 140

Glu Gly Val Val Phe Phe Ser Ser Asn Val Ala Ala Gly Lys Gly Gly
145 150 155 160

Ala Ile Tyr Ala Lys Lys Leu Ser Val Ala Asn Cys Gly Pro Val Gln

165 170 175

Phe Leu Arg Asn Ile Ala Asn Asp Gly Gly Ala Ile Tyr Leu Gly Glu
180 185 190

Ser Gly Glu Leu Ser Leu Ser Ala Asp Tyr Gly Asp Ile Ile Phe Asp
195 200 205

Gly Asn Leu Lys Arg Thr Ala Lys Glu Asn Ala Ala Asp Val Asn Gly
210 215 220

Val Thr Val Ser Ser Gln Ala Ile Ser Met Gly Ser Gly Gly Lys Ile
225 230 235 240

Thr Thr Leu Arg Ala Lys Ala Gly His Gln Ile Leu Phe Asn Asp Pro
245 250 255

Ile Glu Met Ala Asn Gly Asn Asn Gln Pro Ala Gln Ser Ser Lys Leu
260 265 270

Leu Lys Ile Asn Asp Gly Glu Gly Tyr Thr Gly Asp Ile Val Phe Ala
275 280 285

Asn Gly Ser Ser Thr Leu Tyr Gln Asn Val Thr Ile Glu Gln Gly Arg
290 295 300

Ile Val Leu Arg Glu Lys Ala Lys Leu Ser Val Asn Ser Leu Ser Gln
305 310 315 320

Thr Gly Gly Ser Leu Tyr Met Glu Ala Gly Ser Thr Trp Asp Phe Val
325 330 335

Thr Pro Gln Pro Pro Gln Gln Pro Pro Ala Ala Asn Gln Leu Ile Thr
340 345 350

Leu Ser Asn Leu His Leu Ser Leu Ser Ser Leu Leu Ala Asn Asn Ala
355 360 365

Val Thr Asn Pro Pro Thr Asn Pro Pro Ala Gln Asp Ser His Pro Ala
370 375 380

Val Ile Gly Ser Thr Thr Ala Gly Ser Val Thr Ile Ser Gly Pro Ile
385 390 395 400

Phe Phe Glu Asp Leu Asp Asp Thr Ala Tyr Asp Arg Tyr Asp Trp Leu
405 410 415

Gly Ser Asn Gln Lys Ile Asn Val Leu Lys Leu Gln Leu Gly Thr Lys

420

425

430

Pro Pro Ala Asn Ala Pro Ser Asp Leu Thr Leu Gly Asn Glu Met Pro
435 440 445

Lys Tyr Gly Tyr Gln Gly Ser Trp Lys Leu
450 455

<210> 37
<211> 325
<212> PRT
<213> Chlamydia

<400> 37

Leu Lys Ala Thr Trp Thr Lys Thr Gly Tyr Asn Pro Gly Pro Glu Arg
1 5 10 15

Val Ala Ser Leu Val Pro Asn Ser Leu Trp Gly Ser Ile Leu Asp Ile
20 25 30

Arg Ser Ala His Ser Ala Ile Gln Ala Ser Val Asp Gly Arg Ser Tyr
35 40 45

Cys Arg Gly Leu Trp Val Ser Gly Val Ser Asn Phe Phe Tyr His Asp
50 55 60

Arg Asp Ala Leu Gly Gln Gly Tyr Arg Tyr Ile Ser Gly Gly Tyr Ser
65 70 75 80

Leu Gly Ala Asn Ser Tyr Phe Gly Ser Ser Met Phe Gly Leu Ala Phe
85 90 95

Thr Glu Val Phe Gly Arg Ser Lys Asp Tyr Val Val Cys Arg Ser Asn
100 105 110

His His Ala Cys Ile Gly Ser Val Tyr Leu Ser Thr Gln Gln Ala Leu
115 120 125

Cys Gly Ser Tyr Leu Phe Gly Asp Ala Phe Ile Arg Ala Ser Tyr Gly
130 135 140

Phe Gly Asn Gln His Met Lys Thr Ser Tyr Thr Phe Ala Glu Glu Ser
145 150 155 160

Asp Val Arg Trp Asp Asn Asn Cys Leu Ala Gly Glu Ile Gly Ala Gly
165 170 175

Leu Pro Ile Val Ile Thr Pro Ser Lys Leu Tyr Leu Asn Glu Leu Arg
180 185 190

Pro Phe Val Gln Ala Glu Phe Ser Tyr Ala Asp His Glu Ser Phe Thr
195 200 205

Glu Glu Gly Asp Gln Ala Arg Ala Phe Lys Ser Gly His Leu Leu Asn
210 215 220

Leu Ser Val Pro Val Gly Val Lys Phe Asp Arg Cys Ser Ser Thr His
225 230 235 240

Pro Asn Lys Tyr Ser Phe Met Ala Ala Tyr Ile Cys Asp Ala Tyr Arg
245 250 255

Thr Ile Ser Gly Thr Glu Thr Thr Leu Leu Ser His Gln Glu Thr Trp
260 265 270

Thr Thr Asp Ala Phe His Leu Ala Arg His Gly Val Val Val Arg Gly
275 280 285

Ser Met Tyr Ala Ser Leu Thr Ser Asn Ile Glu Val Tyr Gly His Gly
290 295 300

Arg Tyr Glu Tyr Arg Asp Ala Ser Arg Gly Tyr Gly Leu Ser Ala Gly
305 310 315 320

Ser Arg Val Arg Phe
325

<210> 38

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 38

gggtttggga atcagcacat gaaaacctca tatacatttg c

41

<210> 39

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

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~~<400> 39~~

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~~41~~

~~<210> 40~~

~~<211> 55~~

~~<212> DNA~~

~~<213> Artificial Sequence~~

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~~<223> Description of Artificial Sequence: primer~~

~~<400> 40~~

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~~<210> 41~~

~~<211> 80~~

~~<212> DNA~~

~~<213> Artificial Sequence~~

~~<220>~~

~~<223> Description of Artificial Sequence: primer~~

~~<400> 41~~

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~~80~~

~~ctacttcctg cactcaaacc~~